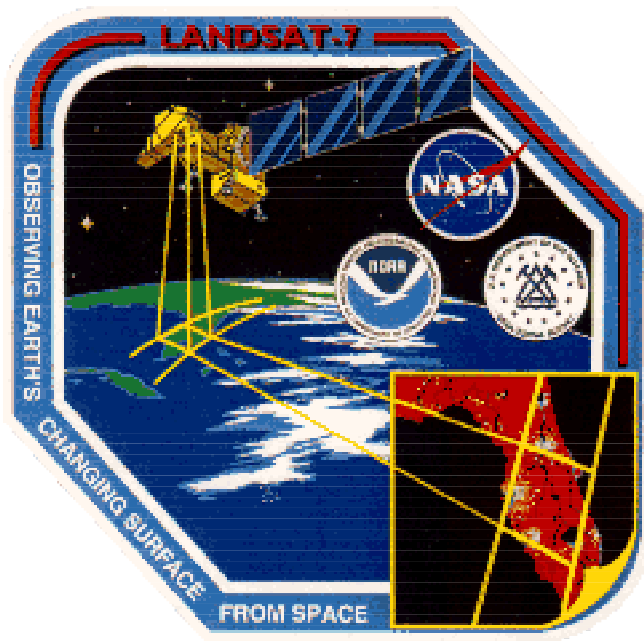


Landsat 7

Basic Information



Supplying data users worldwide with low cost, multi-purpose, terrestrial remote sensing data into the next

In 1992, the US Congress authorized the procurement, launch and operation of a new Landsat satellite. This new system, Landsat 7, is now under construction and is scheduled for launch in April 1999. It will be the latest in a series of earth observation satellites dating back to 1972. The twenty-two year record of data acquired by the Landsat satellites constitutes the longest continuous record of the earth's continental surfaces. Preservation of the existing record and continuation of the Landsat capability were identified in the law as critical to land surface monitoring and global change research.

Landsat 7 will have a unique and essential role in the realm of earth observing satellites in orbit by the end of this decade. No other system will match Landsat's combination of synoptic coverage, high spatial resolution, spectral range and radiometric

calibration. In addition, the Landsat Program is committed to provide Landsat digital data to the user community in greater quantities, more quickly and at lower cost than at any previous time in the history of the program.

The earth observing instrument on Landsat 7, the Enhanced Thematic Mapper Plus (ETM+), replicates the capabilities of the highly successful Thematic Mapper instruments on Landsats 4 and 5*. The ETM+ also includes new features that make it a more versatile and efficient instrument for global change studies, land cover monitoring and assessment, and large area mapping than its design forebears. The primary new features on Landsat 7 are:

- a panchromatic band with 15m spatial resolution

- on board, full aperture, 5% absolute radiometric calibration
- a thermal IR channel with 60m spatial resolution.

The instrument will be supported by a ground network that will receive ETM+ data via X-band direct downlink only at a data rate of 150 Mbps. The primary receiving station will be at the US Geological Survey's (USGS) EROS Data Center (EDC) in Sioux Falls, South Dakota. Substantially cloud-free, land and coastal scenes will be acquired by EDC through real-time downlink, and by playback from an on-board, solid state, recording device. The capacities of the satellite, instrument and ground system will be sufficient to allow for continuous acquisition of all substantially cloud free scenes at the primary receiving station. In addition, a worldwide network of receiving stations will be able to receive real-time, direct downlink of image data via X-band. Each station will be able to receive data only for that part of the ETM+ ground track where the satellite is in sight of the receiving station.

The Landsat 7 system will insure continuity of Thematic Mapper type data into the next century. These data will be made available to all users through EDC at the cost of fulfilling user requests. Browse data (a lower resolution image for determining image location, quality and information content) and metadata (descriptive information on the image) will be available, on-line, within 24 hours of image acquisition by the primary ground station. EDC will process all Landsat 7 data received to "Level 0R" (i.e., corrected for scan direction and band alignment but without radiometric or geometric correction) and archive the data in that

format. A systematically corrected product (Level 1G) will be generated and distributed to users on request. The user will have the option of performing further processing on the data on user-operated digital processing equipment or by a commercial, value-added firm.

The Landsat 7 spacecraft is being built by Lockheed Martin, Valley Forge, Pennsylvania. The ETM+ instrument is a product of Hughes Santa Barbara Remote Sensing. Construction of both is managed through contracts between the manufacturers and the NASA Goddard Space Flight Center, Greenbelt, Maryland.

The Landsat Program, as defined by Congress in 1992 and amended by Presidential Decision Directive/NSTC-3 in May, 1994, is managed cooperatively by the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA), and the USGS. Responsibility for construction of the spacecraft and instrument lies with NASA. The Landsat Program is part of the NASA's global change initiative - the Earth Observing System, administered by the NASA Office of Mission to Planet Earth. Landsat 7 will be operated by NOAA. Data processing, archiving and distribution will be performed by USGS with direction from NOAA. These functions will be executed in coordination with the EDC Distributed Active Archive Center (EDC DAAC) of NASA's Earth Observing System Data and Information System (EOSDIS) at EDC.

*The ETM+ is similar to the ETM instrument on Landsat 6. Landsat 6 was

launched in October 1993, but failed to obtain orbit.

Landsat 7 and ETM+ Characteristics

Band Number	Spectral Range(microns)	Ground Resolution (m)
1	.450 to .515	30
2	5.25 to .605	30
3	.630 to .690	30
4	.750 to .900	30
5	1.55 to 1.75	30
6	10.40 to 12.50	60
7	2.09 to 2.35	30
Panchromatic	.520 to .900	15

Swath width:	185 kilometers
Repeat coverage interval:	16 days (233 orbits)
Altitude:	705 kilometers
Quantization:	Best 8 or 9 bits
On-board data storage:	375 Gb (solid state)
Inclination:	Sun-synchronous, 98.2°
Equatorial crossing:	Descending node; 10:00 AM \pm 15 min.
Launch vehicle:	Delta II
Launch date:	April 15, 1999

Information adapted from:

<http://geo.arc.nasa.gov/sge/landsat/l7.html>